AMENDMENTS TO THE CLAIMS

Accordingly, this listing of claims along with status identifiers will replace prior versions of claims in the application.

1. (Currently amended) A method for improved telemetry of a data signal from a first location to a second location using a wireline having at least three conductors, comprising:

(a) connecting one end of said wireline to a data transmittal means at said first location and the other end of said wireline to a data receiver means at said second location, said data transmittal means having first and second output terminals, said data receiver means having first and second input terminals, wherein

(1) at least two of said conductors are connected to ~~one~~ said first output terminal of said data transmittal means and said at least two of said conductors are connected to ~~one~~ said first input terminal of said data receiver means, wherein said two conductors are not directly adjacent to each other, and

(2) at least one of said conductors is connected to said second output terminal of said data transmittal means and to said second input terminal of said data receiver means;

(b) generating said data signal at said first location;

(c) transmitting said data signal from said data transmittal means through said wireline to said data receiver means; and

(d) receiving said data signal at said second location.

2. (Original) The method of claim 1, wherein said data signal is stored, decoded, processed and displayed after receiving said data signal.

3. (Original) The method of claim 1 wherein said wireline is deployed in a wellbore, said first location is a downhole location in said wellbore, and said second location is at the surface of the earth, and wherein said data signal is generated by a well logging tool at said downhole location.

4. (Original) The method of claim 3 wherein said well logging tool is chosen from the group consisting of the following: caliper logs, cement bond logs, depth logs, downhole video logs, formation resistivity logs, radial microimager logs, neutron logs, oriented density logs, production logs, radial differential temperature logs, radioactive tracer logs, sonic logs, ultrasonic logs, noise logs, temperature logs, pressure logs, well surveying logs, and any combination thereof.

5. (Original) The method of claim 1 wherein said two conductors connected to said first output terminal of said data transmittal means and to said first input terminal of said data receiver means are crosswise paired with opposite conductors.

6. (Original) The method of claim 1 wherein said data signal is transmitted using frequency modulated telemetry.

7. (Original) The method of claim 6 wherein said data signal is transmitted using frequency modulated telemetry, with center carrier frequency within the range of 1 kHz to 100 kHz.

8. (Original) The method of claim 6 wherein said data signal comprises at least two separate data components and each data component is transmitted on its own carrier frequencies.

9. (Original) The method of claim 8 wherein said carrier frequencies are selected to be placed at approximately fixed multiples of each other, and said system frequency multiplier is at least 1.1 and not more than 10.

10. (Original) The method of claim 8 wherein said carrier frequencies are chosen to be prime numbers.

11. (Original) The method of claim 7 wherein said carrier frequencies are selected from the group consisting of 14.9, 18.7, 23.3, 29.2, 36.5, 45.5, 57.0, 71.2, 89.0 kHz, and any combination thereof.

12. (Original) The method of claim 1 further comprising filtering of said data signal to achieve a small deviation in amplitude response as a function of frequency over the

desired signal bandwidth of approximately 1 kHz to 100 kHz or any desired interval therein.

13. (Original) The method of claim 12 wherein the compensation filter consists of cascaded high-pass RC filters that are chosen to achieve a favorable system transfer function that is characterized by a small deviation in amplitude response as a function of frequency.

14. (Original) The method of claim 1 wherein said wireline has at least four conductors.

15. (Original) The method of claim 5 wherein said wireline includes seven conductors numbered 1 through 7, wherein conductor 7 is in the center of said wireline and conductors 1 through 6 are arranged in a circle around conductor 7, and said data signals are carried on crosswise-paired conductors.

16. (Original) The method of claim 5 wherein said wireline includes seven conductors numbered 1 through 7, wherein conductor 7 is in the center of said wireline and conductors 1 through 6 are arranged in a circle around conductor 7, and said signals are carried on conductor 7 and on one set of crosswise paired conductors.

17. (Currently amended) A method for improved telemetry of a data signal from a first location to a second location using a wireline having at least three conductors, comprising:

(a) connecting one end of said wireline to a data transmittal means at said first location and the other end of said wireline to a data receiver means at said second location, said data transmittal means having first and second output terminals, said data receiver means having first and second input terminals, wherein

(1) at least two of said conductors are connected to ~~one~~ said first output terminal of said data transmittal means and said at least two of said conductors are connected to ~~one~~ said first input terminal of said data receiver means, wherein said two of said conductors are not directly adjacent to each other, and

(2) at least one of said conductors is connected to said second output terminal of said data transmittal means and to said second input terminal of said data receiver means;

(b) generating said data signal at said first location;

(c) digitizing said data signal;

(d) modulating said digitized data signal to frequency-modulated carrier signals;

(e) transmitting said frequency-modulated carrier signals from said data transmittal means through said wireline to said data receiver means;

(f) receiving said frequency-modulated carrier signal at said second location; and

(g) demodulating said frequency-modulated carrier signals to recover said data signal.

18. (Original) The method of claim 17 wherein multiple frequency bands are used to transmit said data signal.

19. (Original) The method of claim 17 in which said digitized data signal is transmitted on a carrier frequency in the range of 1 kHz to 100 kHz.

20. (Original) The method of claim 17 wherein two said conductors are crosswise paired with opposite conductors.

21. (Original) The method of claim 20 wherein said wireline includes seven conductors numbered 1 through 7, wherein conductor 7 is in the center of said wireline and conductors 1 through 6 are arranged in a circle around conductor 7, and said signals are carried on crosswise-paired conductors.

22. (Original) The method of claim 20 wherein said wireline includes seven conductors numbered 1 through 7, wherein conductor 7 is in the center of said wireline and conductors 1 through 6 are arranged in a circle around conductor 7, and said signals are carried on conductor 7 and on one set of crosswise paired conductors.

23. (Currently amended) A data telemetry system for use in transmitting a plurality of data signals from a first location to a second location, comprising:

(a) a multi-conductor wireline extending from said first location to said second location, said multi-conductor wireline containing at least three conductors;

(b) data transmittal means at said first location for (1) converting said plurality of data signals into frequency modulated data signals, each of said frequency modulated data signals having a different center carrier frequency in the range of from about 1 kHz to about 100 kHz, (2) summing said frequency modulated signals to create a data input signal, and (3) transmitting said data input signal through said multi-conductor wireline, said data transmittal means having first and second output terminals; and

(c) data receiver means at said second location for (1) receiving said data signal from said multi-conductor wireline, (2) separating said data input signal into said frequency modulated signals, and (3) demodulating said frequency modulated signals to obtain said plurality of data signals, said data receiver means having first and second input terminals;

(d) wherein two of said conductors are connected at one end to ~~one~~ said first output terminal of said data transmittal means and said at least two of said conductors are connected at the other end to ~~one~~ said first input terminal of said data receiver means, and at least one of said conductors is connected at one end to said second output terminal of said data transmittal means and at the other end to said second input terminal of said data receiver means.

24. (Original) The apparatus of claim 23 wherein said wireline has at least four conductors and said conductors are crosswise paired with opposite conductors.

25. (Original) The apparatus of claim 23 wherein said wireline includes seven conductors numbered 1 through 7, wherein conductor 7 is in the center of said wireline and conductors 1 through 6 are arranged in a circle around conductor 7, and said signals are carried on crosswise-paired conductors.

26. (Original) The apparatus of claim 23 wherein said wireline includes seven conductors numbered 1 through 7, wherein conductor 7 is in the center of said wireline

and conductors 1 through 6 are arranged in a circle around conductor 7 and wherein said signals are carried on conductor 7 and on one set of crosswise paired conductors.

27. (Original) The apparatus of claim 23 wherein said data transmittal means is a transformer and said data receiver means is a transformer.